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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application Number: 09/889,508
Filing Date: October 18, 2001
Appellant(s): MATSUDA ET AL.

Morrison & Foerster, LLP
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed 12/06/2006 appealing from the Office action mailed 7/10/2006 and 1/30/2006.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings, which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

4,721,746	Tashiro et al.	1-1988
5,658,662	Leumer	8-1997

4,101,526	Buxbaum	7-1978
5,952,413	Vogt	9-1999

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claims 1, 2, 4, 6, 8 and 11 - 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tashiro et al. (US 4,721,746) in view of Leumer (US 5,658,662).

Tashiro is directed to flameproof synthetic fiber (Title).

As to claim 1, Tashiro teaches a copolymerizing phosphorus compound with the polymer constituting the synthetic fiber (column 3, lines 65 – 67 and column 4, lines 1 – 5). Tashiro teaches that the synthetic fiber can be polyester (column 3, lines 15 – 25). Tashiro teaches that the phosphorus is present in the amount of 0.5 – 7.0% (5,000 – 70,000 ppm) by weight (column 6, lines 30 – 50).

As to claim 2, Tashiro teaches a phosphorus compound as shown by Formula IV (column 3, lines 1 – 10 and column 5, lines 45 – 55).

As to claim 8, Tashiro teaches in Examples 29 and 33 that the polyester yarn of the invention can be woven (columns 15 and 18).

As to claim 11, Tashiro teaches that the synthetic fiber is particularly useful for nonwoven fabrics (column 20, lines 10 – 14).

Tashiro fails to teach that the take-up speed is 1000 – 4500 meters/minute as required by claim 1. Tashiro fails to teach that the draw ratio is not more than 2.88 and has a setting temperature of not less than 150 degrees C as required by claim 12.

Leumer is directed to a high tenacity, low flammability polyester yarn, and production thereof (Title). Leumer teaches polyester formed from dicarboxylic acid and diol, which contains, in the polymer chain, units of formula I (column 3, lines 25 – 35). See column 3, lines 29 – 35 for formula I. Leumer teaches that the polyester yarn is spun at a take-up speed above 300 m/min, preferably from 500 – 1500 m/min (column 8, lines 45 – 54). Leumer teaches in the Examples the use of 3% (or 30,000 ppm) of the phosphorus compound (Table 1). Leumer teaches a breaking extension within the range of 5 – 30% (column 5, lines 20 – 25).

Leumer teaches that the polyester is melt spun and heat set at a temperature ranging from 225 – 240 degrees Celsius (column 8, lines 50 – 65 and column 9, lines 1 – 5). The total draw ratio is from 1:4.5 to 1:6 (column 8, lines 60 – 65).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to create the copolymerized polyester with a phosphorus atom in a side chain of Tashiro with a take-up speed of greater than 300 m/min, in particular at a spinning take-off speed from 500 – 1500 m/min as suggested by Leumer motivated by the desire to create a flame-retardant polyester fiber at a spinning speed which reflects current spinning capacities in order to improve production speed and having a low shrinkage level which is suitable for industrial fabrics (see Leumer, column 9).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to create the copolymerized polyester with a phosphorus atom in a side chain of Tashiro with a draw ratio between 1:4.5 to 1:6 as suggested by Leumer

motivated by the desire to create a flame-retardant polyester fiber with a low shrinkage level which is suitable for industrial fabrics (see Leumer, column 9).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to create the copolymerized polyester with a phosphorus atom in a side chain of Tashiro with a heat setting temperature of 225 – 240 degrees C as suggested by Leumer motivated by the desire to create a flame-retardant polyester fiber with high tenacity and a broad, process-adjustable spectrum of thermal shrinkage which is suitable for industrial fabrics (see Leumer, column 9).

As to claims 1, 4 and 6, although Tashiro in view of Leumer does not explicitly teach the claimed properties detailed by the following formulas: $\tan \delta_{max} \geq 0.236$, $T\alpha - 3.77 \times \ln(dtpf) \leq 137.0$ and $1.331 \leq SG - \sqrt{\Delta n}/8.64 \leq 1.345$ as required by claim 1, a property of having not less than 7720 times up to an occurrence of cutting by abrasion under a load of 0.098 N/tex in a yarn abrasion test as required by claim 1, a shrinkage in hot water (SHW) of not more than 10% as required by claim 1, a tensile elongation at break of 20 – 50% as required by claim 4, the polyester meets the requirements of formulas 4 – 5 as required by claim 6, it is reasonable to presume that the properties discussed above are inherent to Tashiro in view of Leumer. Support for said presumption is found in the use of like materials (i.e. a fiber comprising polyester copolymerized with phosphorus, wherein the phosphorus is present in the amount of 5,000 – 70,000 ppm), which would result in the claimed properties. The burden is upon the Applicant to prove otherwise. *In re Fitzgerald* 205 USPQ 594. In addition, the presently claimed properties would

obviously have been present once the Tashiro in view of Leumer product is provided. Note *In re Best*, 195 USPQ at 433, footnote 4 (CCPA 1977). It should be noted that at this time the Examiner cannot search fiber fineness and density requirements because the values of those parameters are represent format in which they are dependent on inherent values.

It should be noted that even though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same or an obvious variant from a product of the prior art, the claim is unpatentable even though a different process made the prior product. *In re Thorpe*, 227 USPQ 964, 966 (Fed. Cir. 1985). The burden has been shifted to the Applicant to show unobvious differences between the claimed product and the prior art product. *In re Marosi*, 218 USPQ 289, 292 (Fed. Cir. 1983).

Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tashiro et al. (US 4,721,746) in view of Leumer (US 5,658,662), as applied above, and further in view of Buxbaum (US 4,101,526).

Tashiro in view of Leumer teaches the claimed invention above but fails to teach the use of an organic fluorescent brightener in a proportion of 0.01 – 1 wt % and, as a condensation polymerization catalyst, the combination of antimony compound, a germanium compound and a cobalt compound in the amounts that simultaneously satisfy formulas 6 - 9 in claim 7.

Buxbaum is directed to a process for manufacturing a linear polyester containing phosphates suitable for use in the form of a filament (Abstract and column 7, lines 50 – 60). Buxbaum teaches that metal compound mixtures comprising cobalt, germanium and antimony can be employed in the polyester in the amount of 0.001 to 1% by weight (column 6, lines 14 – 20). Buxbaum teaches that other additives can be included such as fluorescent whitening agents (column 7, lines 5 – 15).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to include an organic fluorescent brightener as suggested by Buxbaum in the polyester of Tashiro in view of Leumer motivated by the desire to create a properly whitened polyester to achieve maximal dyeing color uptake and color integrity.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to include a catalyst comprising antimony, germanium and cobalt as suggested by Buxbaum in the polyester of Tashiro in view of Leumer motivated by the desire to create a high polymerization rate.

Tashiro in view of Leumer and Buxbaum discloses the claimed invention except for the level of fluorescent brightener present in the polymer is 0.01 – 1% by weight and that the amount of antimony, germanium and cobalt compounds satisfy the following equations: $30 \leq S \leq 400$, $10 \leq G \leq 100$, $5 \leq C \leq 40$ and $200 \leq S + 2G + C \leq 400$. It should be noted that the amount of fluorescent brightener, antimony, germanium and cobalt compounds are result effective variables. For example, as the amount of brightener increases, the polymer becomes whiter and brighter. When the amount of the

antimony compound added is less than the aforementioned range, the condensation polymerization becomes slow, and when it exceeds the above-mentioned range, the L value as measured with a Hunter's color-difference meter unpreferably decreases. When the amount added of the germanium compound is less than the above-mentioned range, the condensation polymerization becomes slow, and when it exceeds the above-mentioned range, the production cost becomes higher because germanium is extremely expensive, and the b value of the polymer unpreferably increases. When the amount added of the cobalt compound is less than the above-mentioned range, the b value of the color tone of the resulting polymer becomes high. It would have been obvious to one having ordinary skill in the art at the time the invention was made to add the fluorescent brightener in the amount of 0.01 – 1% by weight since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980). In the present invention, one would have been motivated to optimize the amount of optical brightener to create suitably white polyester and to optimize the levels of antimony, germanium and cobalt to create cost efficient, properly tinted polyester which is polymerized in an efficient manner.

Claims 9 – 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tashiro et al. (US 4,721,746) in view of Leumer (US 5,658,662), as applied above, and further in view of Vogt (US 5,952,413).

Tashiro in view of Leumer teaches that the synthetic fiber of the present invention is useful for textile, filling, interior, woven and non-woven fabrics, artificial leather and artificial fur (Tashiro, column 20, lines 10 – 14 and Examples 29 and 33).
Tashiro in view of Leumer fails to teach that the woven or knitted fabric has undergone a raising treatment to create a suede fabric as required by claims 9 and 10.
Vogt teaches a method of making a polyurethane suede-like material (Title). Vogt teaches that the textile fabric can comprise any synthetic fiber such as polyester (column 4, lines 45 – 48). Additionally, the fabric may be in any form such as woven, non-woven or knitted (column 4, lines 53 – 55).
It would have been obvious to one of ordinary skill in the art at the time the invention was made to use a raising treatment to create a suede fabric as suggested by Vogt in the application of Tashiro in view of Leumer motivated by the desire to have an aesthetically pleasing and soft material.

Although Tashiro in view of Leumer and Vogt does not explicitly teach the claimed coefficient of friction of a surface of 0.200 – 0.300 as required by claim 9 and after-flame time of not more than 3 seconds as measured by the Applicant's test as required by claim 10, it is reasonable to presume that the claimed coefficient of friction of a surface of 0.200 – 0.300 as required by claim 9 and after-flame time of not more than 3 seconds as measured by the Applicant's test as required by claim 10 is inherent to Tashiro in view of Leumer and Vogt. Support for said presumption is found in the use of like materials (i.e. phosphorus-containing polyester woven fabric with a suede surface),

which would result in the claimed properties. The burden is upon the Applicant to prove otherwise. *In re Fitzgerald* 205 USPQ 594. In addition, the presently claimed property of the claimed coefficient of friction of a surface of 0.200 – 0.300 as required by claim 9 and after-flame time of not more than 3 seconds as measured by the Applicant's test as required by claim 10 would obviously have been present once the Tashiro in view of Leumer and Vogt product is provided. Note *In re Best*, 195 USPQ at 433, footnote 4 (CCPA 1977).

(10) Response to Argument

The appellant is claiming an invention of a flame-retardant polyester fiber, which has superior properties for color fastness, whiteness, abrasion resistance and heat stability. The appellant is claiming an invention as stated in claim 1 as a flame-retardant polyester fiber comprising phosphorus compound copolymerized polyester comprising a phosphorus atom in a side chain. Appellant states the Examiner must provide evidence that the fibers in Tashiro and Leumer would necessarily satisfy formulas (1)-(3) of claim 1. Appellant states that Tashiro and Leumer fail to describe a fiber produced with the claimed draw ratio. Appellant states that a fiber produced according to Tashiro and Leumer would not necessarily satisfy formulas (1)-(3) of Appellant's claim 1. The appellant raises the argument that the references do not anticipate or render obvious a draw ratio of less than 2.88 at a temperature of no less than 150°C, as described in dependent claim 12, and therefore the examiner's rejection should be reversed. However, claim 1 does not include the process limitation of draw ratio in the independent claim 1. Further, Appellant has not provided any evidence on record to

show that only fibers having the claimed draw ratio meet the equations set forth in claim 1. Applicant is arguing that the process of using a certain drawing ratio is different than the prior art process and that the claimed process leads to a different result, however there is no evidence of record to support this assertion. It is the burden of the Appellant to provide evidence that the fiber of Leumer does not meet the limitations of the Appellant's fiber.

The Appellant argues that the current 35 USC § 103(a) rejection citing Leumer does not anticipate or render obvious the Appellant's fiber because the draw ratio is higher than the Appellant's draw ratio. However, Leumer teaches it is of particular importance to maintain a drawing and setting temperature and a draw ratio making it possible to produce low flammability yarns having tenacity, breaking extension and modulus of elasticity comparable to the high tenacity yarns made of unmodified polyesters (col. 9, lines 32-38). Leumer teaches that the production of multifilament yarns according to the invention of Leumer, can be carried out batch-wise with a pre-draw and a second drawing stage and alternatively teaches the production of multifilament yarns according to a continuous spin-draw process. Leumer is teaching how to change the process variables to achieve specific fiber product properties. Examiner concludes that it would have been obvious to optimize the process of Leumer to achieve a high strength, flame retardant fiber as taught by Leumer's process, since Leumer recognizes that the drawing and setting temperature and draw ratio are result effective variables which are directly related to the properties of flammability, tenacity, breaking extension and modulus of elasticity.

Leumer is directed to producing a fiber of extremely high strength and to achieve this high strength discloses a total draw ratio of 4.5 to 6.0. However, it is noted that Leumer also teaches a first draw ratio of 2.4 to 3.9, (col. 9, lines 7-9), which is within the range of less than 2.88 of the current invention. Claim 12 recites a drawing after melt spinning to a draw ratio of less than 2.88. Leumer teaches this step at col. 9, lines 7-9. Claim 12 does not preclude additional drawing steps. The draw ratio, total draw ratio or first draw ratio could be interpreted as the same or different and therefore Examiner determines that Leumer teaches a draw ratio within the range of the current application. Leumer teaches the process of the claimed invention that produces the claimed product with the claimed inherent properties and therefore Examiner equates the product of Leumer with the claimed product of the current application.

Appellant states that the rejection of claim 7 under 35 USC 103(a) as being unpatentable over Tashiro in view of Leumer and Buxbaum should be reversed. Appellant is arguing that the rejection over Leumer is not sound and therefore the rejection over Tashiro in view of Leumer and Buxbaum is also not sound. Examiner has responded to Appellant's arguments over Leumer in the proceeding paragraphs.

Appellant states that Examiner cites Vogt with respect to the claimed organic fluorescent brightener, condensation polymerization catalyst antimony compound, and germanium compound. Examiner respectfully submits this statement is incorrect and Examiner did not cite Vogt in claim 7 rejections. Examiner cited Tashiro in view of Leumer and Buxbaum wherein Buxbaum teaches the components of claim 7, which are

organic fluorescent brightener, condensation polymerization catalyst, antimony compound, and germanium compound.

Appellant states that the rejection of claim 9 and 10 under 35 USC 103(a) as being unpatentable over Tashiro in view of Leumer and Vogt should be reversed. Appellant is arguing that the rejection over Leumer is not sound and therefore the rejection over Tashiro in view of Leumer and Buxbaum is also not sound. Examiner has responded to Appellant's arguments over Leumer in the proceeding paragraphs. Vogt is cited with respect to the claimed raising treatment.

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

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PRIMARY EXAMINER

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